



Debris Forecasting



Debris forecasting is normally a pre-disaster technique used to predict debris quantities. Debris Forecasting can also be used to determine the type and number of stand-by contracts required to remove and dispose of the predicted debris.

However, certain planning assumptions must be made concerning the type and magnitude of debris generating events. For instance, a debris management plan would assume that a specific type of event, such as a major earthquake in a heavily populated area, would affect the area with large quantities of primarily construction and demolition debris. Or, the plan may assume a range of debris generating events from small floods and tornados to catastrophic similar events.

Debris Forecasting Techniques

There are three basic techniques that are used for debris forecasting:

- An analysis of prior debris generating events can be conducted for your community or a similar community. With this analysis completed it may be possible to plan for effective response to similar type events. However, because the event may have been limited in scope or experienced debris staff is no longer available, this method has severe limitations.
- More commonly, a community-based risk analysis is completed to determine the types and quantities of debris generated by various events. This analysis is then used as a critical component of the debris management plan.
- Computers can be used for both of the first two techniques to perform calculations and present the analysis. However, there are a range of computer-based prediction models available to perform some of the more routine calculations, use a community's Geographical Information System (GIS) and plan for any number of event scenarios.

When these three techniques are combined a very effective analysis can be completed.



Historical Analysis

In order to complete an historical analysis of prior debris events, some basic information should be gathered:

- Prior event(s) should be selected from your community or from communities who have experienced the type of disaster you have forecasted for your community.
- Key staff members responsible for debris activities should be interviewed to determine procedures that were effective and those that were not.



Debris Forecasting

A simple method can be used to systematically forecast the type and quantity of debris for a community.

Obtain detailed maps of your community and highlight them with an indication of the type of land use in each area, such as urban, industrial, rural and mixed. This area separation will make your analysis easier as similar land use areas can be assumed to have similar debris types.

- For instance: parks, orchards, groves, nurseries and tree-lined streets will have similar debris quantities based on an acreage or mileage basis.
- Commercial and Industrial areas tend to have heavy amounts of construction and demolition type debris.
- Residential areas can be a combination of vegetative, construction and demolition debris.

Develop a representative sample of the debris in each area.

Debris quantities can be estimated using the guidelines provided:

- One story house = Volume in cubic yards (cy) times 0.33
- Personal property from flooded home without basement = 25-30 cy
- Single wide mobile home = 290 cy
- Double wide mobile home = 415 cy

Regarding vegetation, the terms light, medium and heavy are somewhat subjective, but the general guide is:

- Light - covering the house, yard or driveway
- Heavy - canopy of trees covering the house
- Medium - used for everything else

Third, project the sampling of debris for each area and provide a total of the amount and type of debris for each area. The grand total of all these calculations will provide you with an estimate useful for planning purposes.

Computerized modeling programs have been developed to provide reasonable debris predictions for communities under various disaster types. Types of these interactive models are:

- USACE
- Private Industry
- HAZUS



Please note that this type of debris forecasting is not an exact science. Broad assumptions and wide-scale projections must be made throughout the process. However, even with its inaccuracies, the resulting quantity estimate can be very useful in completing the next



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phases of the planning process, such as selecting Debris Management Sites or developing contracts.



Additional Resources

- [CalEMA Concept of Operations](#)
- [Debris Removal Flyer](#)
- [Private Property Debris Removal](#)
- [Debris Contracting Flyer](#)
- [Debris Estimating Flyer](#)
- [Debris Management Plan Flyer](#)
- [CalEMA Debris Training Manual](#)

Web Sites

www.calema.ca.gov
www.calrecycle.ca.gov
www.fema.gov



Got Questions?

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